9137

Diag. Cht. Nos. 1000-3, 1229-2 & 1232-2.

FORM C&GS-504

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey: Hydrographic

Field No. MI-40-1-70 Office No. H-9137

LOCALITY

State: North Carolina

General locality: ~~Atlantic Ocean~~ Off Hatteras Island

Locality: ~~Offshore - Oregon Inlet~~ Flat Shoals to Wimble Shoals

1970

CHIEF OF PARTY

Edwin K. McCaffrey, CDR, USESSA

LIBRARY & ARCHIVES

DATE 5-4-73

USCOMM-DC 37022-P66

9137

FORM C&GS-537 (8-15-59)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

REGISTER NO.

H-9137

HYDROGRAPHIC TITLE SHEET

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NO.

MI-40-1-70

State North Carolina

General locality ~~Atlantic Ocean~~ Off Hatteras Island

Locality ~~Offshore - Oregon Inlet~~ Platt Shoals to Wimble Shoals

Scale 1:40,000 Date of survey Jul.19 to Aug.27, 1970

Instructions dated Rev.Inst.dated Jul.9, 1970 Amend.dated Aug. 7,1970 Amend.dated Aug.27,1970 Project No. OPR-438

Vessel USC&GS Ship MT MITCHELL (MSS-22)

Chief of party Edwin K. McCaffrey, CDR, USESSA, Commanding Officer

Surveyed by Thomas E. Gerish, LT, Tom Gryniewicz, LTJG, Andrew L. Sikes, ENS, Stewart McGee, ENS, Stephen C. Schwartz, ENS, Gregory R. Bass, ENS, Gary M. Adair, ENS, Gary L. Sundin, ENS

Soundings taken by echo sounder, ~~hand lead~~ DE-723B

Graphic record scaled by Ship Personnel

Graphic record checked by Ship Personnel

Protracted by Cal Comp Plotter Automated plot by Atlantic Marine Center

Soundings penciled by CalComp Plotter

Soundings in ~~fathoms~~ feet at MLW ~~MKLW~~

REMARKS: Ship personnel scanned the graphic records and entered corrected and insert soundings on the Raw Data printout. The corrected Raw Data printout was used to construct a Smooth Raw Data tape and printout. The Smooth Raw Data printout was proof-read. All records (mylar boatsheet, fathograms, sawtooth records, raw data tapes and printouts, smooth raw data tapes and printouts, plotting abstracts, corrector tapes and printouts and tidal data) were forwarded to Atlantic Marine Center, Attn: CFN3

Appl to DTL 5-8-73

KWW 8/25/92

USCOMM-DC 19086-P65

Descriptive Report

To Accompany

Hydrographic Survey Sheet

MI-40-1-70 (H-9137)

Project OPR-438

1970 Field Season

Scale 1:40,000

USC&GS Ship MT MITCHELL (MSS-22)

Edwin K. McCaffrey, CDR, USESSA

Chief of Party

PROGRESS SKETCH

OPR-438

North Carolina Marine Charting

Hydrographic Operations

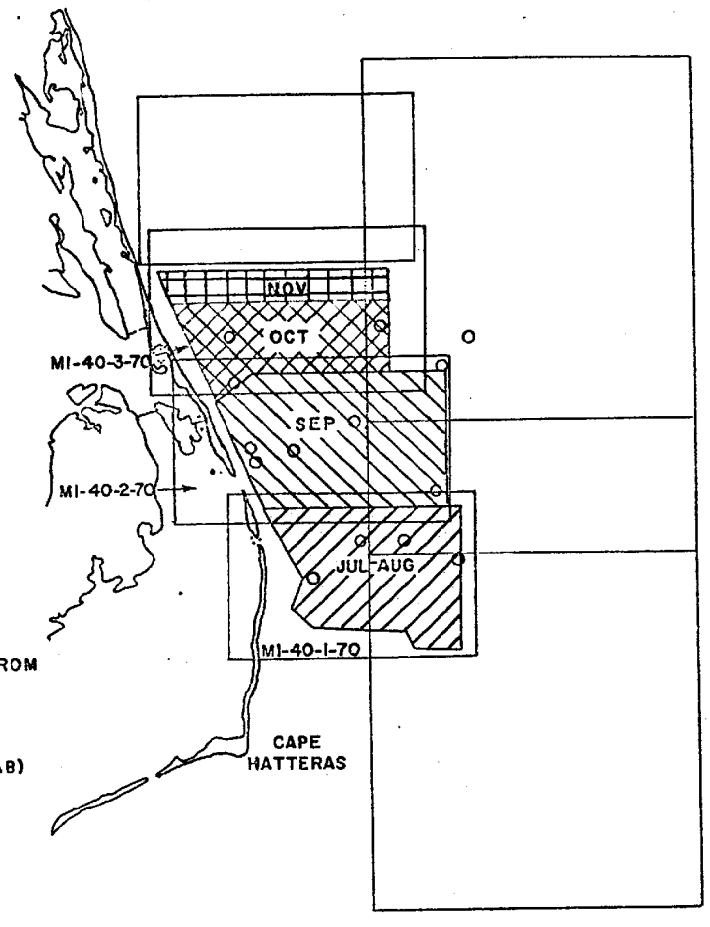
1970

USC&GS Ship MT MITCHELL (MSS-22)

Edwin K. McCaffery, CDR, USESSA, Com'd'g.

Scale of C&GS Chart 1000

JUL.	AUG.	SEP.	OCT.	NOV.	
152	2613	3027	1990	1167	MILES, SOUNDING LINE
320	419	492	481	150	MILES, DISTANCE TO & FROM
724	1286	1067	1576	930	MILES, MISCELLANEOUS
40	56	0	6	29	BOTTOM SAMPLES (GRAB)
1	0	0	0	0	NANSEN CAST
1	4	5	2	2	STD CAST



A. PROJECT

This survey was accomplished as part of Project OPR-438, North Carolina Marine Charting, in accordance with the following instructions:

1. Revised Project Instructions dated July 9, 1970
2. Amendment to Instructions dated August 7, 1970
3. Amendment to Instructions dated August 27, 1970

B. AREA SURVEYED

The survey was conducted between July 19, 1970 and August 27, 1970 off the east coast of North Carolina, south of Oregon Inlet.

The survey comprised 2463 nautical miles of sounding lines covering an area of 338 square nautical miles.

The western limit of the survey is the 60 foot depth curve adjacent to the shoreline. The northern limit is Latitude 35°43' North, the eastern limit is Longitude 74°59' West, and the southern limit is Latitude 35°26' North.

This survey junctions with prior survey H-8810 (1964) along the southern edge. Scale of H-8810 is 1:40,000.

C. SOUNDING VESSEL

All hydrography on this survey was accomplished by USC&GS Ship MT MITCHELL (MSS-22)

D. SOUNDING EQUIPMENT

All soundings obtained were recorded in feet (to the nearest foot) using a Raytheon Survey Fathometer Model DE-723B, Serial Number 1280.

Velocity corrections were determined from Salinity/Temperature/Depth/Velocity (STDV) casts made using a Bissett-Berman Model

9040-4C STDV, Serial Number 5633. The first STDV cast was made simultaneously with a Nansen cast for comparison, and very good agreement was obtained.

A total of four STDV casts were made (see sketch) to determine seasonal and areal variation throughout the project area. Layer corrections for each cast deviated from the average of all four by less than 0.1 foot. In each case, therefore, the values from the four casts were averaged and plotted to obtain the final velocity corrector. A copy of the velocity tape printout is included in this report. The required graphs and abstracts are to be included in the report "Corrections to Echo Soundings" for the project.

A thermistor was towed throughout the entire survey to determine any areas requiring separate velocity correctors. A Rustrak recorder was used in conjunction with the thermistor and it was placed where it was under constant watch. However, no substantial temperature changes were encountered during the survey.

Attention is invited to Commanding Officer, USC&GS Ship MT MITCHELL memorandum to Director, Atlantic Marine Center, dated July 29, 1970. (Copy included in this report). The memorandum concerns a cold water layer within the limits of this survey. This layer seems to be common knowledge and shows in the publication "The Gulf Stream" issued by NODC, Washington, each month.

Settlement and Squat correctors were obtained from data gathered on October 8, 1969 for Standard Speed (175 R.P.M. 10' Pitch) and Half Speed (105 R.P.M. 10' Pitch). Since the variation between these two speeds amounts to a difference in correctors of only 0.7 of a foot, linear interpolation between the two values was used to determine correctors for intermediate speeds.

A zero draft corrector was applied throughout the survey since the fathogram initial was set and maintained at 14 feet to compensate for draft. Several observations during the course of the work indicated that the draft aft (where the transducer is mounted) remained constant even as fuel and supplies were consumed from the forward section.

Frequent checks for initial setting, A-F Scale comparison check, stylus arm alignment, and speed count indicated that no additional instrument corrections were necessary. Several apparent corrections for phase, initial, stylus length, etc. proved to

be non-existent when subsequent evaluation noted these deviations were caused by poor quality of arcs and depth lines printed on the graphic record. Also, some problems with incorrectly punched paper feed holes were encountered. This resulted in marginal A-F Scale checks, shifting initial, and stylus arm misalignment on the graphic record. In some cases, constant realignment of the paper was needed.

E. SMOOTH SHEET

All fathograms were scanned and a Smooth Raw Data punch tape, with annotated printout, was made. The Smooth Raw Data records contain all corrected regular and insert soundings. The Smooth Raw Data printout was proof-read.

The smooth sheet is scheduled to be computer plotted at the Atlantic Marine Center using field data which have been encoded on paper punch tapes. These Raw Data tapes were compiled aboard ship during the operation and include information on time, depth, day number, position number and two Hi-Fix readings. All data was recorded using ASCII code, (Model 33ASR teletype), single indicator format. These parameters were recorded using a manual hydrographic data logger and depth module. All necessary corrector tapes, with printouts, were prepared.

F. CONTROL

Hi-Fix, operating at a frequency of 1618.650 KHz, was used for position control during all operations. The range-range system with slave stations located at two shore sites was used.

Shore station "FISH" (Latitude 35°20'50.733"N. Longitude 75°30' 06.631"W.) near Avon, North Carolina and shore station "WILD" (Latitude 35°41'02.160"N. Longitude 75°28'57.195"W.) six miles south of Oregon Inlet, North Carolina were located by the Atlantic Marine Center personnel using electronic traverse from existing horizontal control in the vicinity.

The Hi-Fix was calibrated at the start of each cruise, and whenever lane count was in doubt. Calibration was accomplished by observing a 3-point visual sextant fix off Oregon Inlet and simultaneously recording the Hi-Fix receiver values. Correctors were then obtained by plotting the 3-point sextant fix on a 1:20,000 scale calibration sheet (furnished by Atlantic Marine

Center) and scaling the Hi-Fix values of the sextant position. A comparison of the scaled Hi-Fix position values and the observed receiver values was made and the corrector established. Objects for visual control were located by Atlantic Marine Center personnel. MT MITCHELL personnel later located a U.S. Corps of Engineers dredging rear range marker and used it as an additional visual calibration signal. The position of the marker is Latitude 35°47'50.6"N. Longitude 75°32'44.1"W. The position was determined by tape traverse from station "OREGON", and sextant angle at "OREGON" between Bodie Island Lighthouse and the newly located Rear Range.

Wimble Shoals Lighted Whistle Buoy R"10" provided another method for checking lane count. Lane count values were established for this buoy prior starting hydrography. Frequent lane count checks were made using the circling method.

Hi-Fix was inoperative for about 82 hours during this survey. This was due either to electronic breakdowns or electrical atmospheric disturbances.

G. SHORELINE

There is no shoreline to be considered in this survey.

H. CROSSLINES

Crosslines amounted to 5.9% of the total miles of sounding lines. Crossings were in very good agreement throughout the survey.

I. JUNCTIONS Smooth sheet junctions were made with H-9155 (1970) H-9231 (1971)

Junction was made with the contemporary survey H-8810 (EXPLORER 1964) 1:40,000 along the southern edge of the survey. The junction of the two surveys was in good agreement in depths over 90 feet with the MT MITCHELL soundings generally the same or 1 foot deeper. The agreement in waters less than 90 feet was fair with some 3 foot differences appearing between the two surveys. These discrepancies are likely due to a combination of factors, chief of which are the use of predicted tides and the changeable nature of the bottom.

J. COMPARISON WITH PRIOR SURVEYS

The only prior survey covering this area is H-1721 (1886), scale

1:200,000 which has some 25 soundings in common with this survey. The prior survey was recorded in fathoms and apparently used visual control at the inshore ends of the lines with the offshore work accomplished using dead reckoning. A comparison of the sample survey soundings is shown below. The prior survey soundings were changed to feet for the comparison.

Latitude	Longitude	H-1721 (1886)	H-9137 (1970)
35°36.5'	75°22.7'	69'	66'
35°37.2'	75°12.9'	108'	104'
35°38.1'	75°03.0'	156'	131'
35°31.1'	75°18.5'	84'	78'
35°32.0'	75°05.5'	135'	117'

It can be readily seen that the inshore ends of the lines offer some agreement but the offshore soundings are somewhat far apart. It is believed that the main cause of the differences is the quality of the control for each survey.

Two Pre-Survey Review Items appear on this survey. Item #6 on Pre-Survey Sheet 2 (58 foot sounding) was investigated with a development on August 25, 1970. The shallowest sounding found was 57 feet, reduced using final tide data. It appears 600 yards, bearing 315°T. from the charted 58 foot sounding. No indication of Pre-Survey Review Item #1C, on Pre-Survey Sheet #1 (65 foot F/V) was found on the fathograms within one-half mile radius of charted position of this wreck. Pos. 2549 To 2550

K. COMPARISON WITH CHARTS

Comparisons were made with the Coast & Geodetic Survey charts listed below:

C&GS Chart	Scale	Edition	Corrected Through Notice to Mariners
1000	1:1,200,000	23	29/69
1109	1:416,944	22	14/70
1229	1:80,000	15	51/69
1232	1:80,000	16	3/70

The comparisons between C&GS charts and Boatsheet MI-40-1-70 (H-9137) are shown below. Some of the chart soundings are recorded in fathoms and where this is the situation the soundings were changed to feet for comparison.

C&GS Chart 1000 (soundings recorded in fathoms)

Latitude	Longitude	Charted Sounding Fathoms	Charted Sounding Feet	H-9137 (1970)
35°40.5'	75°22.2'	14	84	83
35°32.6'	75°20.0'	11	66	79
35°31.0'	75°05.0'	22	132	115

C&GS Chart 1109 (soundings ~~recorded~~ charted in fathoms)

35°44.0'	75°20.0'	8	48	51
35°29.5'	75°21.3'	9	54	58
**35°32.6'	75°15.0'	11	66	~~86~~ 88
35°40.5'	75°14.0'	20	120	116
35°37.6'	75°03.1'	26	156	130

**Chart shows symbol for sunken danger cleared by wire drag for the depth indicated. This was not a Pre-Survey Review item. The wreck shows clearly on the fathograms.

C&GS Chart 1229 (soundings ~~recorded~~ charted in feet)

35°39.61'	75°25.00'	60	62
35°34.74'	75°22.85'	67	44
35°36.41'	75°20.75'	102	88
35°36.28'	75°18.72'	76	82

C&GS Chart 1232 (soundings ~~recorded~~ charted in feet)

35°34.80'	75°22.80'	67	48
35°33.65'	75°17.95'	58	63
35°29.15'	75°11.40'	109	113

The entire survey area appears on C&GS charts 1000 and 1109. Inshore areas of the survey appear on the other two charts.

Generally, most of the soundings in this survey agree within 5 feet with charted depths and occur within 0.4 miles of the charted positions. The discrepancies in the above comparisons

can be explained by displacements of charted soundings. The shape and location of the 60 foot depth curves on Charts 1229 and 1232 agree with this survey except where this survey shows a narrow outcrop in the curve roughly parallel to 75°22.4' and extending between 35°32.4' and 35°34.2'. The general shape of the 20 fathom curve on Charts 1000 and 1109 is also in agreement with this survey, but the charted curve is located 1½ to 2 miles farther to the west.

Charts 1000 and 1109 show a wire-dragged wreck at Latitude 35° 32.5'N. Longitude 75°15.0'W. Clearance is given as 11 fathoms. The feature also appears on Chart 1232 cleared to 69 feet. The wreck is visible on two fathogram records with a clear depth of 85 feet. The fathogram also shows scour depths to 116 feet in the immediate area of the shoalest depth. This verifies charted position, however least depth of 11 fathoms (69 feet) originating with wire drag investigation should be retained. Pos 2630 To 2631

L. ADEQUACY OF SURVEY

This survey is complete and adequate to supersede previous surveys of the area.

M. AIDS TO NAVIGATION

Wimble Shoals Lighted Whistle Buoy "10" (Coast Guard Light List Volume I, Page 21, Number 166) is the only aid to navigation in the survey area. It is properly located and adequately serves the purpose for which it was located.

No unofficial or unlisted aids to navigation were discovered in the area.

N. STATISTICS

3204	Positions
2463	Nautical Miles of Sounding Lines
144	Nautical Miles of Cross Lines
40	Bottom Samples
338	Square Miles Surveyed

O. MISCELLANEOUS

Tide reducers were derived from the Hampton Roads standard tide

gage (Latitude 36°57'N. Longitude 76°20'W.). An attempt was made to install a portable pressure gage (bubbler) at a site previously used by the Coast & Geodetic Survey (Avon Fishing Pier, Avon, N.C.). The installation was unsatisfactory because of problems with pier instability, and interference from fishermen hooking the nitrogen feed hose and otherwise interrupting operations. The installation was dismantled on verbal direction from the Atlantic Marine Center. It is understood that the Rockville office has directed that a permanent installation is to be made in the area and that the gage was subsequently installed.

The mylar boatsheet, constructed by Atlantic Marine Center, is unsatisfactory. Plastic inks are needed for permanent sounding and position entries. Regular India inks will not stand the constant usage of the sheet. The data rubs off under places where a plotter rests his arm or where the Odessey protractor is used, etc. India inks will not adhere in places where the sheet graining has been polished through handling or where the natural oils, from a plotter's hands, have entered on the sheet. Plastic inks will also not remain on the sheet if the ink is used to cover pencil (mylar or regular lead pencil). The ship obtained Acetograph (Rapidograph type) pens and the recommended inks. This material will do an adequate job only if the plotter keeps the ink flowing by constant writing. A short pause will dry up the pen. Consequently, the plotter spends more time cleaning pens than is required to enter the data. Unless an improvement is made regarding the plastic ink situation, the mylar boatsheets will have to be completed using India inks and refreshing the figures (soundings and position numbers) constantly. We are continuing the use of various marking methods in an effort to solve this problem.

The bottom samples were obtained using a 150 pound Shipek grab sampler (Model 860). The samples were split in half and one half was air mailed to Dr. J.W. Pierce at Smithsonian Institute as per directives. The remaining half was forwarded to Mr. Stephen G. Conrad, Division of Mineral Resources, Department of Conservation and Development, Raleigh, North Carolina as directed by Atlantic Marine Center. The samples were double-bagged in plastic bags. A sample label was completed and placed between the two plastic bags. Copies of C&GS Form 733M "Log Sheet M" were completed and forwarded with the samples along with a copy of the "Abbreviations and Symbols" page from the Nautical Chart Manual.

P. RECOMMENDATIONS

1. It is suggested that the use of mylar boatsheets be discontinued until a proven inking system is devised. (See Paragraph O).

2. It is recommended that standardization of teletype models issued to ships for recording survey data be attempted. The teletype troubles are amplified by the many small differences in the models on hand. At one time, this ship had six machines on board. Three of the machines were different enough as to require extensive review, by the electronics personnel, prior to starting repair work. It is further recommended that teletype machines have cog-feed paper advance systems. The other type require constant alignment of the paper and in the case of perforated page size or fan fold paper, the perforated edge hangs-up on the paper depressor and eventually jams the teletype. During complete automation these paper feed troubles will constantly harass any operator and will require a constant watch to see that the printouts will be readable.

3. It is strongly suggested that the ship be permitted to send electronics personnel to a teletype maintenance school. Unless the on-board repairs are made available this ship will require 100% back-up in teletype machines. The problem with keeping a large percentage of back-up machines is the tendency to cannibalize one machine (with little wrong with it) to keep other machines in working condition. These machines tend to wind up as little more than junk and ultimately leads to a highly uneconomical operation. The idea of a 100% back-up seems unwarranted. The better answer is repair facilities (trained personnel) in reasonable proximity of each ship.

4. The Coast & Geodetic Survey has invested over $30,000 in a STD system for this ship. For most effective use of this investment it is suggested that some of the survey technicians be sent to the Coast Guard school at Governors Island, New York City, N.Y. during the lay-up period, to learn how to properly use this equipment.

Respectfully Submitted:

Tom Gryniewicz

Tom Gryniewicz
LTJG, NOAA

Approved and Forwarded:

Edwin K. McCaffrey

Edwin K. McCaffrey
CDR, NOAA
Commanding Officer

APPROVAL SHEET

Field Number MI-40-1-70

Registry Number H-9137

The field work and processing of data from this hydrographic survey was under my immediate daily supervision. The boat-sheet and all records have been reviewed and are approved by me. It is believed this survey is complete and adequate to supersede all prior surveys of the area.

Edwin K. McCaffrey
CDR, NOAA
Commanding Officer

FIELD PARTY TIDE NOTE

OPR-438 North Carolina Marine Charting

The control station for the project was the standard tide gage at Hampton Roads (Sewells Point), Virginia, Latitude 36°57' N. Longitude 76° 20' W. This station operates on 75° West (+5) time, and the height datum is 3.9 feet below Mean Low Water.

Hourly heights for this project were furnished by the Washington office and were logged on data tapes with printouts. These tapes and printouts were forwarded to Atlantic Marine Center. Attn: CFN3, for final compilation of tide data in accordance with CFN3 memorandum File Number D-2-3-2, Serial Number 70-32 (copy of the memorandum included in this report).

The following corrections to the hourly heights were furnished by Washington in order to zone the boatsheets:

Zone	Time Diff.	Range Ratio
Latitude 34°00'-36°00'	-2 Hours	1.4
Latitude 36°00'-37°00'	-1½ Hours	1.4

The ship MT MITCHELL operated on local 60° West (+4) time from the start of hydrography on July 19, 1970 until October 30, 1970. The ship's time was then changed to conform with 75° West (+5) time zone.

Entire Survey used -2 hr. Corr. @ 60th Mer. time

Submitted by:

Gregory R. Bass

Gregory R. Bass
ENS, NOAA

Boatsheet MI-40-1-70 (H-9137)

Position Data

Julian Day	Date (1970)	Position	Time (From)	to	Position	Time (To)
200	Jul. 19	0001	091000		0048	211100
201	Jul. 20	0049	202030		0087	232200
202	Jul. 21	0088	013400		0169	234300
203	Jul. 22	0170	001100		0216	235500
204	Jul. 23	0217	240000		0241	021000
217	Aug. 5	0242	033000		0455	232000
218	Aug. 6	0456	163200		0551	234800
219	Aug. 7	0552	000000		0866	235200
220	Aug. 8	0867	001600		1200	235600
221	Aug. 9	1201	000000		1535	235700
222	Aug. 10	1536	000000		1831	235600
223	Aug. 11	1832	000000		1893	110300
229	Aug. 17	1894	222500		1902	230500
230	Aug. 18	1903	011400		2066	235600
231	Aug. 19	2067	000000		2367	235600
232	Aug. 20	2368	000000		2570	235600
233	Aug. 21	2571	000000		2587	010800
237	Aug. 25	2588	194400		2630	235600
238	Aug. 26	2631	000000		2915	235600
239	Aug. 27	2916	000000		3204	215400

ELECTRONIC CONTROL PARAMETERS

1. Project # OPR-438 2. Reg. # H-9137 3. Field # MI-40-1-70

4. Type of Control: HI-FIX RANGE-RANGE (Hi-Fix, Raydist, EPI, etc.)

5. Frequency 1618.650 (for conversion of electronic lanes to meters)

6. Mode of Operation (check one):

Range-Range ☐ Range-Visual ☐

Range One (R_1) Station I.D.	FISH	Lat.	#35	20	50.7330	"
		Long.	75	30	06.361	"
Range Two (R_2) Station I.D.	WILD	Lat.	35	41	02.160	"
		Long.	75	28	57.195	"

Hyperbolic (3-station) ☐ Hyper-Visual ☐

Slave One Station I.D.		Lat.	°	'	"
		Long.	°	'	"
Master Station I.D.		Lat.	°	'	"
		Long.	°	'	"
Slave Two Station I.D.		Lat.	°	'	"
		Long.	°	'	"

7. Location of Survey:

Range-Range ☐ Imagine an observer is standing at R_1 Station and looking directly at R_2 (check one):

Survey area is to observer's Right ☒ A=Ø

Survey area is to observer's Left ☐ A=1

Hyperbolic ☐ Looking from survey area toward Master Station:

Slave One must be to observer's Left;

Slave Two must be to observer's Right.

8. ☐ This form is submitted as an aid in preparing a boat sheet.

☐ This form applies to all data on this survey.

☐ This form applies to part of the data on this survey.

Vessel EDP #	From Time	From Day	To Time	To Day	Position Numbers (inclusive)	
						to
						to
						to

9. Remarks:

FORM # 1

FIG. 15

PARAMETERS FOR DIGITAL COMPUTING
POLYCONIC PROJECTION

(1) PROJECT No. OPR - 438
(2) H No. 9137
(3) FIELD No. MI-40-1-70
(4) REQUESTED BY ATLANTIC MARINE CENTER
(5) SHIP OR OFFICE SHIP MT MITCHELL
(6) DATE REQUIRED A.S.A.P.
(7) VISUAL ☐
(8) ELECTRONIC [X] (FILL OUT FORM #3)

(10) XKN (SP 5) DISTANCE FROM CMER TO EAST EDGE (NYX = 1) OR WEST EDGE (NYX = 0). 24,215.04 METERS

(11) YKN (SP 241) DISTANCE FROM EQUATOR TO SOUTH EDGE OF SHEET. 3,922,469.943 METERS

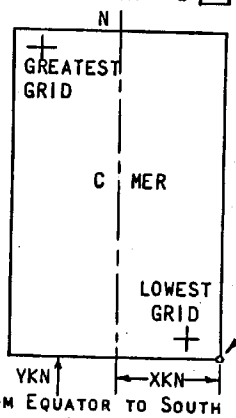
(12) CENTRAL MERIDIAN 75 ° 16 ' 00 "

(13) SURVEY SCALE 1: 40,000

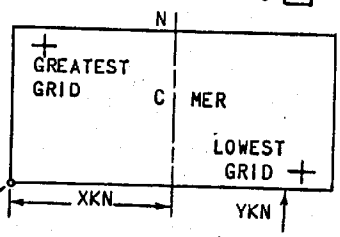
(14) SIZE OF SHEET (CHECK ONE) 36X54 [X] 42X60 ☐ OTHER ☐

(15) NYX, ORIENTATION OF SHEET (CHECK ONE)

NYX = 1 ☐



NYX = 0 [X]



(9) PLOTTER ORIGIN (CORNER OF SHEET)

LATITUDE 35 ° 26 ' 00 "
LONGITUDE 75 ° 32 ' 00 "

GRID LIMITS

(16) GREATEST LATITUDE 35 ° 44 ' 00"
(17) LOWEST LATITUDE 35 ° 26 ' 00"
(18) DIFFERENCE ° 18 ' 00"

(19) 2 ' 00 "
(20) 9 YSN

(21) GREATEST LONGITUDE 75 ° 32 ' 00"
(22) LOWEST LONGITUDE 74 ° 58 ' 00"
(23) DIFFERENCE ° 34 ' 00 "

(24) 2 ' 00 "
(25) 17 XSN

(PROJECTION LINE INTERVAL, PAGE 4 HYDRO MANUAL)

LIST G.P. OF ALL STATIONS TO BE PLOTTED ON THIS PROJECTION ON THE BACK OF THIS FORM. (DEG., MIN., SEC.)

U.S. DEPARTMENT OF COMMERCE
Environmental Science Services Administration
COAST AND GEODETIC SURVEY

Date: October 5, 1970

File No: D2-3-2
Ser. No: 70-32

Reply to Attn of: CFN3

Subject: Smooth Tides

To: Commanding Officers,
AMC Based Ships

Officer in Charge,
ECFP 742
HSL 1257

The following procedures supersede Sections 8-4 and 9-4 in the Instruction Manual for Automated Hydrographic Surveys and will be observed by all AMC vessels and field parties conducting hydrographic/bathymetric surveys which will be smooth plotted at AMC.

1. Hourly heights shall be scanned from merigrams and logged directly on punched paper tape (tide tape format). See enclosure.

2. Hourly height tapes and printouts will be sent to AMC along with the survey. A field party tide note is required in the Descriptive Report (paragraph 7-6, Hydrographic Manual).

3. Merigrams will be sent to the Chief, Tides Section (C3312), Rockville, with a cover letter (copy to CFN3), requesting the following information be furnished to AMC Processing Division (CFN3):

a. Datum: Value of MLLW on merigram.

b. Time and height relationship between gages operated in the area surveyed.

c. Recommended zoning for tide correctors (if any).

4. Where tide correctors are to be determined from standard gage records, the vessel will request the Tide Section to send a listing of hourly heights to the vessel for preparation of the tape.

5/ Descriptive Reports submitted by the field will not contain Form 712, but must contain a field party tide note designating the gage or gages controlling tide correctors. AMC will obtain Rockville approval of the computer-generated tide corrections and insert the approved 712 in Descriptive Reports. A copy will be sent to the field unit for insertion in their copy of the Descriptive Report.

Allen L. Powell
RADM, USESSA
Director, Atlantic Marine Center

U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET 3/2/73

Processing Division: Atlantic Marine Center

Hourly heights are approved for

Tide Station Used (NOAA form 77-12): Hampton Roads, Va.

Period: July 19-Nov 12, 1970

HYDROGRAPHIC SHEET: H-9171, H-9155, H-9137

OPR: 438

Locality: Coast of North Carolina

Plane of reference (mean ~~lower~~ low water): 3.9 ft.

Height of Mean High Water above Plane of Reference is 2.5 ft.

Remarks: Zoning: Apply time and height corrections recommended in project instructions to Hampton Roads hourly heights.

Robert A. Cummings
Chief, Tides Branch

FORM CD-121 (11-69) (PREV. EDS. A.O. 206-10)

UNITED STATES GOVERNMENT

Memorandum

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

TO : Director, Atlantic Marine Center

DATE: July 29, 1970

In reply refer to:

Attn : CFN2

FROM : Commanding Officer
USC&GS Ship MT MITCHELL (MSS-22)

SUBJECT: Cold water layer observed during STD cast for velocity corrections, OPR-438, North Carolina Marine Charting

On July 22, 1970 an oceanographic station was occupied in 43 meters of water at Lat. 35°37'N. Long. 74°59'W. (location by LORAN "A"). In an effort to obtain sound velocity values S, T, D, SV sensor #5633 was lowered to 40 meters at 10-15 meters per minute. The cast started by passing through a surface layer of mixed water to a depth of 10-12 meters, at that depth the thermocline was reached. At approximately 30 meters an extremely rapid decrease in temperature, salinity, and sound velocity was observed.

A Nansen cast was taken to precisely determine the temperature and salinity of the water column, and verify the existence of the water mass indicated by the S, T, D, Sv sensor. The Nansen bottles, equipped with reversing thermometers, were spaced to facilitate velocity computations and with an estimated wire angle of 0°. Bottles were placed at 9, 18, 27, and 36 meters with additional bottles at 29, 31, and 40 meters in an effort to determine the boundaries of the indicated layer. During the time the Nansen cast was soaking, another S, T, D, SV cast was taken to obtain a simultaneous comparison.

Data from the Nansen cast proved the existence of a mid-layer of colder, less saline water no more than 9 meters thick.

A third S, T, D, SV cast was taken inshore of the first station at Lat. 35°36'N. Long. 75°16'W. Because of shoal water the depth of the cast was limited to 25 meters. There was no indication of the mid-layer at this position. The sound velocity values closely followed the previous station

values; therefore the corrections computed for that station apply to the entire working area.

There is mention of this mid-layer of cold water in the publication "The Gulf Stream, a Physical and Dynamical Description" Henry Stommel, 2nd Edition, 1965, Pages 62--65, Paragraph-Transfer Processes Across the Stream.

Kenneth A. MacDonald

VELOCITY CORRECTION TAPE PRINTOUT MI-40-1-70 (H-9137) 19 JULY - 27 AUGUST 1970

DEPTH		VEL. CORR.	VEL. TAB			
000300	0	0000	0001	000	000000	000000
000350	0	0005				
000410	0	0010				
000480	0	0015				
000570	0	0020				
000670	0	0025				
000800	0	0030				
000960	0	0035				
001130	0	0040				
001310	0	0045				
001500	0	0050				
001660	0	0055				

TRA CORRECTION /TABLE INDICATOR SHEET MI-10-1-70 19 JULY - 27 AUGUST 1970

TIME	TRA	VEL TAB IND.	DAY			
094000	0	1005	0001	200	000000	000000
100000	0	1010				
102100	0	1005				
104530	0	1010				
142100	0	1005				
144800	0	1010				
152300	0	1005				
154330	0	1010				
161330	0	1005				
165500	0	1010				
172800	0	1005				
175400	0	1010				
182000	0	1005				
184230	0	1010				
193300	0	1005				
195500	0	1010				
202600	0	1005				
211100	0	1010				
202030	0	1005	0001	201	000000	000000
013400	0	1005	0001	202	000000	000000
114900	0	1010				
001100	0	1010	0001	203	000000	000000
220100	0	1005				
000000	0	1005	0001	204	000000	000000

[illegible] 0 1005 0001 217 000000 000000

103800 0 1005 0001 218 000000 000000

[illegible] 0 1005 0001 219 000000 000000

122000 0 1010

124400 0 1005

001600 0 1005 0001 220 000000 000000

000000 0 1005 0001 221 000000 000000

000000 0 1005 0001 222 000000 000000

024800 0 1010

030000 0 1005

000000 0 1005 0001 223 000000 000000

031000 0 1010

074300 0 1005

104400 0 1010

222500 0 1005 0001 229 000000 000000

011400 0 1005 0001 230 000000 000000

213400 0 1010

214000 0 1005

225400 0 1010

230000 0 1005

000000 0 1005 0001 231 000000 000000

103100 0 1010

115800 0 1005

000000 0 1005 0001 232 000000 000000

000000 0 1005 0001 233 000000 000000

194400 0 1005 0001 237 000000 000000

000000 0 1005 0001 238 000000 000000

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132500 0 1010
133200 0 1005
152300 0 1010
155300 0 1005
192400 0 1010
194000 0 1005
000000 0 1005 0001 239 000000 000000
003430 0 1010
004000 0 1005
021200 0 1010
022000 0 1005
```

CORRECTOR TAPE PRINTOUT MI-40-1-70 (H-913-7) 19 JULY 70 – 27 AUGUST 1970

TIME	ENB	ANGL	POS	DAY	R.L	R2L	TIDE	TRK	
091000	0	0000	0001	200	100034	100016	0000	000	000
142600	0	0000	0012	200	100034	100116	0000	000	000
152300	0	0000	0017	200	100034	100316	0000	000	000
165500	0	0000	0026	200	100034	100616	0000	000	000
193300	0	0000	0037	200	100034	100516	0000	000	000
210600	0	0000	0047	200	100034	100616	0000	000	000
202030	0	0000	0049	201	000010	100060	0000	000	000
212100	0	0000	0060	201	000010	100160	0000	000	000
212900	0	0000	0062	201	000010	100060	0000	000	000
213300	0	0000	0063	201	000010	000040	0000	000	000
214100	0	0000	0065	201	000010	000140	0000	000	000
214500	0	0000	0066	201	000010	000240	0000	000	000
013400	0	0000	0088	202	000010	100060	0000	000	000
061530	0	0000	0094	202	100290	000540	0000	000	000
063930	0	0000	0100	202	100290	000440	0000	000	000
070330	0	0000	0106	202	100290	000540	0000	000	000
091200	0	0000	0127	202	100290	000440	0000	000	000
095600	0	0000	0138	202	100290	000540	0000	000	000
101600	0	0000	0140	202	100290	000640	0000	000	000
211800	0	0000	0163	202	000020	000045	0000	000	000
213350	0	0000	0164	202	000020	000245	0000	000	000
001100	0	0000	0170	203	000020	000045	0000	000	000
003000	0	0000	0174	203	000020	000445	0000	000	000

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055500 0 0000 0176 203 000100 001445 0000 000 000
053730 0 0000 0177 203 000020 000045 0000 000 000
160700 0 0000 0178 203 000020 000045 0000 000 000
000000 0 0000 0217 204 000020 000045 0000 000 000
033000 0 0000 0242 217 100002 000617 0000 000 000
210300 0 0000 0422 217 100002 000517 0000 000 000
225200 0 0000 0448 217 100002 000617 0000 000 000
231600 0 0000 0454 217 100002 000417 0000 000 000
163200 0 0000 0456 218 000020 000020 0000 000 000
181600 0 0000 0481 218 100080 000020 0000 000 000
202800 0 0000 0505 218 100180 000020 0000 000 000
204400 0 0000 0509 218 100380 000020 0000 000 000
210800 0 0000 0512 218 100280 000020 0000 000 000
215600 0 0000 0524 218 100280 000120 0000 000 000
230800 0 0000 0541 218 100280 000020 0000 000 000
232000 0 0000 0544 218 100380 000020 0000 000 000
233600 0 0000 0548 218 100380 100080 0000 000 000
000000 0 0000 0552 219 100380 100080 0000 000 000
010000 0 0000 0567 219 100380 000020 0000 000 000
010800 0 0000 0569 219 100280 000020 0000 000 000
032400 0 0000 0596 219 100380 000020 0000 000 000
032800 0 0000 0597 219 100480 000020 0000 000 000
052800 0 0000 0625 219 100480 000120 0000 000 000
133200 0 0000 0722 219 100380 000120 0000 000 000
232000 0 0000 0858 219 100580 000120 0000 000 000
234000 0 0000 0863 219 100580 000020 0000 000 000
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001600 0 0000 0867 220 100580 000020 0000 000 000

041600 0 0000 0924 220 100780 000020 0000 000 000

205600 0 0000 1156 220 100880 100060 0000 000 000

214800 0 0000 1169 220 100980 100080 0000 000 000

220400 0 0000 1173 220 100880 000020 0000 000 000

221600 0 0000 1176 220 100980 000020 0000 000 000

222000 0 0000 1177 220 100880 000020 0000 000 000

225100 0 0000 1185 220 100980 000020 0000 000 000

232400 0 0000 1192 220 101080 000020 0000 000 000

233600 0 0000 1195 220 101180 100080 0000 000 000

000000 0 0000 1201 221 101180 100080 0000 000 000

000400 0 0000 1202 221 101280 100080 0000 000 000

003600 0 0000 1210 221 101480 100080 0000 000 000

005200 0 0000 1214 221 101480 000020 0000 000 000

010400 0 0000 1217 221 101380 000020 0000 000 000

010800 0 0000 1218 221 101380 000120 0000 000 000

012000 0 0000 1222 221 101380 000320 0000 000 000

013600 0 0000 1226 221 101380 000420 0000 000 000

014400 0 0000 1228 221 101380 000520 0000 000 000

024000 0 0000 1232 221 000020 100080 0000 000 000

222400 0 0000 1515 221 000020 100180 0000 000 000

224800 0 0000 1521 221 100080 100180 0000 000 000

232400 0 0000 1531 221 100080 100280 0000 000 000

000000 0 0000 1536 222 100080 100280 0000 000 000

000100 0 0000 1539 222 100180 100280 0000 000 000

000400 0 0000 1552 223 100180 100280 0000 000 000

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000600 0 0000 1834 223 100180 100380 0000 000 000
222500 0 0000 1894 229 100210 100180 0000 000 000
230000 0 0000 1901 229 100210 100280 0000 000 000
011400 0 0000 1903 230 100010 100180 0000 000 000
014000 0 0000 1909 230 100110 100180 0000 000 000
022400 0 0000 1920 230 100210 100180 0000 000 000
031600 0 0000 1933 230 100210 100280 0000 000 000
032000 0 0000 1934 230 100210 100380 0000 000 000
041600 0 0000 1943 230 100210 100380 0000 000 000
054400 0 0000 1965 230 100210 100480 0000 000 000
060400 0 0000 1970 230 100210 100580 0000 000 000
065200 0 0000 1982 230 100310 100680 0000 000 000
070800 0 0000 1986 230 100310 100580 0000 000 000
071600 0 0000 1988 230 100310 100680 0000 000 000
072000 0 0000 1989 230 100410 100580 0000 000 000
072800 0 0000 1991 230 100410 100580 0000 000 000
073200 0 0000 1992 230 100410 100380 0000 000 000
073600 0 0000 1993 230 100410 100480 0000 000 000
080800 0 0000 2000 230 100310 100580 0000 000 000
085600 0 0000 2012 230 100310 100480 0000 000 000
090000 0 0000 2013 230 100410 100480 0000 000 000
090400 0 0000 2014 230 100410 100580 0000 000 000
200300 0 0000 2015 230 000020 000020 0000 000 000
000000 0 0000 2067 231 000020 000020 0000 000 000
000000 0 0000 2303 232 000020 000020 0000 000 000
104500 0 0000 2525 232 000020 000120 0000 000 000
200000 0 0000 2523 232 000030 100020 0000 000 000
```

213200 0 0000 2535 232 000030 100220 0000 000 000

223200 0 0000 2550 232 000030 100120 0000 000 000

000000 0 0000 2571 233 000030 100120 0000 000 000

003200 0 0000 2579 233 000030 100020 0000 000 000

003600 0 0000 2580 233 000030 000080 0000 000 000

005600 0 0000 2584 233 000030 000180 0000 000 000

194400 0 0000 2588 237 000010 000040 0000 000 000

000000 0 0000 2631 238 000010 000040 0000 000 000

152300 0 0000 2815 236 000010 000040 0000 000 000

000000 0 0000 2916 239 000010 000040 0000 000 000

003200 0 0000 2922 239 000010 100060 0000 000 000

050800 0 0000 2979 239 000010 000040 0000 000 000

210800 0 0000 3191 239 000210 000040 0000 000 000

V 508

FORM C&GS-733M (5-66)

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

Boatsheet MI-40-1-70

Sheet No. 1

U.S. DEPARTMENT OF COMMERCE
ESSA
COAST AND GEODETIC SURVEY

VESSEL	PROJ. NO.	YEAR		CHECKED BY	DATE CHECKED
USC&GSS MT. MITCHELL	OPR-438	1970	Bathymetric Survey-N. Carolina	T.J. McConnell	July 22, 1970

SERIAL NO.	DATE (1970)	SAMPLE POSITION LATITUDE (North)	SAMPLE POSITION LONGITUDE (West)	DEPTH Feet	WEIGHT OF SAMPLER	APPROX. PENETRATION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief i.e., slope, plain, disposition, etc.)	OBS. INIT.
	July				150					Skipek Grab Sampler	
1	19	35°30.4'	75°20.9'	65	lb.	NA	NA	gray	fne gy S brK Sh		JG
2	19	35°33.5'	75°21.1'	85				black gray	fne gy S bk M brK Sh		JG
3	19	35°36.4'	75°21.1'	80				gray	fne gy S brK Sh		JG
4	19	35°39.1'	75°20.5'	94				gray	fne gy S		JD
5	19	35°42.0'	75°20.1'	82				gray	fne gy S brK Sh		CM
6	19	35°43.1'	75°17.1'	102				gray	fne gy S brK Sh		CM
7	19	35°40.1'	75°17.1'	89				gray	fne gy S brK Sh		CM
8	19	35°37.1	75°17.1'	87				gray	fne dK gy S brK Sh		CM
9	19	35°35.0'	75°17.1'	77				gray	fne gy S brK Sh		JG
10	21	35°32.0'	75°17.3'	84				gray	fne gy S brK Sh	sticky	JG
11	21	35°43.1'	75°00.1'	150				brown	crs br S brK Sh	Pt's in sand	JD
12	21	35°40.1'	75°01.0'	150				brown	fne br S brK Sh		JD
13	21	35°31.0'	75°14.0'	102				gray	fne gy S brK Sh	sticky, worm tubes	JG
14	21	35°33.1'	75°13.1'	104				gray	fne gy S brK Sh	sticky	JD
15	21	35°36.1'	75°13.1'	110				gray	fne gy S brK Sh		JG
16	21	35°39.1'	75°13.1'	117				gray	fne gy S brK Sh		JG
17	21	35°42.0'	75°13.1'	121				black gray	fne gy S bK gty M brK Sh		JG

Use more then one line per sample if necessary

USCOMM-DC 37019-P66

FORM C&GS-733M (6-66)

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

Boatsheet MI-40-1-70

Sheet No. 2

U.S. DEPARTMENT OF COMMERCE
ESSA
COAST AND GEODETIC SURVEY

VESSEL	PROJ. NO.	YEAR		CHECKED BY	DATE CHECKED
USC&GSS MT. MITCHELL	OPR-438	1970	Bathymetric Survey - N. Carolina	T.D. McConnell	July 22, 1970

SERIAL NO.	DATE (1970)	SAMPLE POSITION LATITUDE (North)	SAMPLE POSITION LONGITUDE (West)	DEPTH (Feet)	WEIGHT OF SAMPLER	APPROX. PENETRATION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief i.e., slope, plain, disposition, etc.)	OBS. INIT.
18	July 21	35°43.1'	75°10.1'	121	150 lb.	NA	NA	brown	fne br S brK Sh	Skipek Grab Sampler	JG
19	21	35°40.1'	75°10.1'	116				gray	fne gy S brK Sh		JD
20	22	35°38.0'	75°10.3'	106				gray	fne gy S brK Sh		JD
21	22	35°36.0'	75°10.1'	116				gray	fne dK gy S brK Sh		JD
22	22	35°35.1'	75°10.1'	116				gray	fne dK gy S brK Sh		JD
23	22	35°31.0'	75°10.1'	107				brown	crs br S brK Sh		JD
24	22	35°30.0'	75°07.1'	112				brown	crs br S brK Sh		JD
25	22	35°32.3'	75°07.1'	121				blacK	stK bK S brK Sh		JD
26	22	35°35.4'	75°07.3'	119				blacK gray	fne gy S bK M		CM
27	22	35°38.0'	75°07.2'	118				brown	fne br S		JG
28	22	35°41.0'	75°07.1'	112				brown	crs br S brK Sh		CM
29	22	35°43.7'	75°06.9'	121				gray brown	dK gy M crs br S		RH
30	22	35°42.8'	75°03.8'	138				gray	dK gy M S brK Sh		RH
31	22	35°39.5'	75°04.0'	131				brown	crs br S brK Sh		CM
32	22	35°35.5'	75°04.1'	127				brown	crs br S brK Sh		CM
33	22	35°32.7'	75°04.2'	123				brown	crs br S brK Sh		CM
34	22	35°30.5'	75°03.8'	124				gray	fne dK gy S Sh		CM

Use more than one line per sample if necessary.

USCOMM-DC 37019-P66

FORM C&GS-733M (6-66)

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

Boatsheet MI-49-1-70

U.S. DEPARTMENT OF COMMERCE
ESSA
COAST AND GEODETIC SURVEY

Sheet No. 3

VESSEL	PROJ. NO.	YEAR		CHECKED BY	DATE CHECKED
USC&GSS MT. MITCHELL	OPR-438	1970	Bathymetric Survey-N. Carolina	T.J. McConnell	July 23, 1970

SERIAL NO.	DATE (1970)	SAMPLE POSITION LATITUDE (North)	SAMPLE POSITION LONGITUDE (West)	DEPTH (Corrected) Feet	WEIGHT OF SAMPLER	APPROX. PENETRATION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief i.e., slope, plain, disposition, etc.)	OBS. INIT.
35	July 22	35°27.8'	75°04.2'	113	150 lb.	NA	NA	brown	fne br S	Skipek Grab Sampler	CM
36	22	35°27.0'	75°00.8'	125				gray	fne gy S brK Sh		JG
37	22	35°29.8'	75°01.2'	130				gray	fne gy S brK Sh		JG
38	22	35°32.6'	75°01.0'	137				gray	fne gy S brK Sh		JG
39	22	35°35.3'	75°01.0'	143				brown	fne br S brK Sh		JG
40	22	35°38.1'	75°01.1'	149				brown	crs br S brK Sh		JG

Use more than one line per sample if necessary.

USCOMM-DC 37019-P66

FORM 197
(3-16-55)

GEOGRAPHIC NAMES

Survey No. H-9137

Name on Survey	On Chart No. A	On previous survey No. B	On U. S. quadrangle Maps C	From local information D	On local Maps E	P. O. Guide or Map F	Rand McNally Atlas G	U. S. Light List H	K	
Atlantic Ocean										1
Wimble Shoals										2
										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
				PREPARED BY CARTOGRAPHER						22
				Chas E. Harrington						23
				Staff Geographer (Acting)						24
				Aug 9, 1973						25
										26
										27

FORM C&GS-946A
(REV. 11-65)
(PRES. BY HYDROGRAPHIC MANUAL, 6-94)

U.S. DEPARTMENT OF COMMERCE
ESSA
COAST AND GEODETIC SURVEY

VERIFIER'S REPORT

HYDROGRAPHIC SURVEY, H 9137

INSTRUCTIONS - This form serves to identify items of a check list in verification together with items which are separately reported to the Reviewer. The form is not to be forwarded to the Reviewer. A report, which is prepared for the Reviewer, should identify items by number and letter and will be filed in the Descriptive Report until the survey is reviewed.

CL - Check List Items: should be checked as having been completed during the verification processes.

R - Report Item: This column refers to those items reported to the reviewer and is used to indicate the items discussed.

Part I - DESCRIPTIVE REPORT	CL	R
Note: The verifier should first read the Descriptive Report for general information and problems.		
1. The Descriptive Report was consulted, paragraphs checked if found satisfactory, and notations were made in soft black pencil regarding action taken. Remarks Required: -- None	✓	
2. Soundings originating with the survey and mentioned in the Descriptive Report have been verified and checked in soft black pencil, including latitude and longitude, together with position identification. Remarks Required: -- None	✓	
3. All reference to survey sheets mentioned in the Descriptive Report should include registry number and year. Remarks Required: -- None	✓	
Part II - SHORELINE AND SIGNALS		
4. Source of shoreline signals Remarks Required: -- List all surveys a. Give earliest and latest dates of photographs b. Field inspection date c. Field Edit date d. Reviewed-Unreviewed	✓	
5. The transfer of contemporary topographic information was carefully examined and reconciled with the hydrography. Remarks Required: -- Discuss remaining differences	✓	
6. The plotting of all triangulation stations, topographic stations and hydrographic signals has been checked and noted in processing stamp No. 42 on the smooth sheet. Remarks Required: -- None	✓	
7. Objects on which signals are located and which fall outside of the high-water line have been described on the sheet. Remarks Required: -- List those signals still unidentified.	✓	
Part III - JUNCTIONS		
Note: Make a cursory comparison preliminary to inking soundings in area of overlap.		
8. All junctions of contemporary or overlapping sheets were transferred in colored ink and verified curves were made identical. Remarks Required: -- None	✓	
9. The notation in slanted lettering "JOINS H---- (19)" was added in colored ink for all verified contemporary adjoining or overlapping sheets. Those not verified are shown in pencil. Remarks Required: -- None	✓	

Part III - JUNCTIONS (Continued)	CL	R
10. Junctions with contemporary surveys were satisfactory except as follows: Remarks Required: -- Consider conditions after adjustments have been made; note adjustments made. Make special notes of Butt junctions and areas which are SUPERSEDED.	✓	
Part IV - VOLUMES		
11. All items affecting the plotting of the survey which are entered in the remarks columns of the sounding records were noted and check marked. In all cases appropriate action was taken and exceptions noted in the volumes. Remarks Required: -- None	✓	
12. Condition of sounding records was satisfactory except as follows: Remarks Required: -- Mention deficiencies in completeness of notes or actions for the following: (a) rocks (b) line turns (c) position values of beginning and ending of lines (d) bar check or velocity correctors (e) time recording (f) notes or markings on fathograms (g) was reduction of soundings accurately done? (h) was scanning accurate? (i) were peaks at uneven intervals missed? (j) were stamps completed? (k) references to adjacent features	✓	
Part V - PROTRACTING		
13. All positions verified instrumentally were check marked in color in the sounding records, and verifier initialed the processing stamp. Remarks Required: -- None	✓	
14. The protracting and plotting of all unsatisfactory crossings were verified. Remarks Required: -- None	✓	
15. All detached positions locating critical soundings, rocks, buoys, breakers, obstructions, kelp, etc., were verified and the position numbers are legible. Remarks Required: -- None	✓	

Fig. 20 (cont'd.)
Form 946 A (back of form)

Part V - PROTRACTING (Continued)	CL	R
16. The protracting was satisfactory except as follows: Remarks Required: -- Refers to protracting in general except for specific faults repeated often, or faults in control information, which required considerable replotting or adjustments.	✓	
17. The protractor has been checked within the last three months. Remarks Required: -- Date of check, type of protractor and number.	✓	
Part VI - SOUNDINGS		
18. All soundings are clear and legible, and critical soundings are a little larger than adjacent soundings. Remarks Required: -- None	✓	
19. Sounding line crossings were satisfactory except as follows: Remarks Required: -- Discuss adjustments.		
20. The spacing of soundings as recorded in the records was closely followed; Remarks Required: -- None	✓	
21. The scanning, reduction, spacing, plotting of questionable soundings have been verified. Remarks Required: -- None	✓	
22. The smooth plotting of soundings was satisfactory except as follows: Remarks Required: -- Refer to legibility, errors in spacing, and errors in numbers - but not to errors in scanning.	✓	
Part VII - CURVES		
23. The depth curves have been inspected before inking. Remarks Required: -- By whom was the pencilled curves inspected. GPT	✓	
24. The low-water line and delineation of shoal areas have been properly shown in accordance with the following: a. From T-Sheet in dotted black lines b. From soundings in orange c. Approximate position of sketched curve is dashed orange d. Approximate position of shoal area not sounded in black dashed Remarks Required: -- None	✓	
25. Depth curves were satisfactory except as follows: (This statement should not refer to the manner in which the curves were drawn). Remarks Required: -- Indicate areas where curves could not be drawn completely because of lack of soundings. For some inshore areas a general statement is sufficient.	✓	

Part VIII - AIDS TO NAVIGATION	CL	R
26. All fixed aids located [illegible] with those on the contemporary topographic sheets, have been shown on the survey. Remarks Required: -- [illegible] of any nature listed.	✓	
27. All floating aids listed in the Descriptive Report should be verified and checked in soft black pencil, including latitude and longitude and position identification. Remarks Required: -- None	✓	
Part IX - BOATSHEET		
28. The boat sheet was constantly compared with the smooth sheet with reference to notes, position of sounding lines and supplemental information. Remarks Required: -- None	✓	
29. Heights of rocks awash were correctly reduced and compared with topographic information. Remarks Required: -- Note excessive conflicts with topographic information.	✓	
Part X - GENERAL		
30. All information on the sheet is shown in accordance with figures 82 and 83 in the Hydrographic Manual (Pub. 20-2). Remarks Required: -- None	✓	
31. Unnecessary pencil notes have been removed from the sheet. Remarks Required: -- None	✓	
32. Degree, minute values and symbols have been checked; also electronic distance arcs have been properly identified and checked on the smooth sheet. Remarks Required: -- None	✓	
33. The bottom characteristics are adequately shown. Remarks Required: -- None	✓	
Part XI - NOTES TO THE REVIEWER		
34. Unresolved discrepancies and questionable soundings.		
35. Notation of discrepancies with photogrammetric survey inserted in report of unreviewed photogrammetric survey or on copy.	✓	
36. Supplemental information.		

Verified by C. F. Tretethan

Date 18 April 1973

FORM C&GS-946A (11-68)

USCOMM-DC 36272-P68

FIG. 18.

DESCRIPTIVE REPORT DATA RECORD		
PART I SMOOTH SHEET PREPARATION	PREPARED BY/OPERATOR	DATE
A. PLOTTER OPERATOR		
B. DISTORTION MARKS PLOTTED		
C. PROJECTION INTERSECTIONS PLOTTED		
D. POINTS OF ELECTRONIC CONTROL ARCS PLOTTED		
E. OVERLAYS PREPARED BY		
1. POSITION NUMBER		
2. EXCESS SOUNDINGS		
3. PRELIMINARY SMOOTH PLOT		
4. LIST OTHERS		
A.		
B.		
F. SOUNDING SELECTION BY		
G. PLOTTER INPUT PREPARED		
H. CHECKED		
I. DESCRIPTIVE REPORT ADDENDUMS		
PART II SMOOTH SHEET COMPLETION		
	CARTOGRAPHER	DATE
A. DISTORTION SCALE TICKS IDENTIFIED BY NOTE		
B. PROJECTION INTERSECTIONS VERIFIED BY	G.F. Trefethen	3-27-73
C. PROJECTION LINES RULED BY	EDP-AMC	3-26-73
D. ELECTRONIC CONTROL ARCS RULED AND LOCATION VERIFIED	EDP-AMC	3-26-73
E. OVERLAYS COMPLETED BY		
1. POSITION NUMBER LEADERS ADDED	G.F. Trefethen	4-11-73
2. EXCESS SOUNDING OVERLAY COMPARED	E.J. Fields	3-13-73
3. PRELIMINARY SMOOTH PLOTS COMPARED	E.J. Fields	3-13-73
4. OTHERS UTILIZED		
A.		
B.		
F. DESCRIPTIVE REPORT ADDENDUM	G.F. Trefethen	4-14-73
G. CONTROL STATIONS VERIFIED	E.J. Fields	10-31-72
H. POSITIONS MANUALLY PLOTTED	E.J. Fields	10-31-72
I. MANUAL PLOT VERIFIED	G.F. Trefethen	3-27-73
J. SHORELINE APPLIED		
K. BOTTOM CHARACTERISTICS ADDED	G.F. Trefethen	4-6-73
L. NOTES AND DEPTH CURVES ADDED	G.F. Trefethen	4-10-73

FORM C&GS-946
(REVI 11-65)
(PRESC. BY
HYDROGRAPHIC
MANUAL 20-2,
6-96, 7-131)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY
NAUTICAL CHART DIVISION

HYDROGRAPHIC SURVEY STATISTICS

HYDROGRAPHIC SURVEY NO. H-9137

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET & PNO	1	BOAT SHEETS	1
DESCRIPTIVE REPORT	1	OVERLAYS	3

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS / SOURCE DOCUMENTS
ENVELOPES	X					
CAHIERS	1		X			1
VOLUMES						
BOXES			8			

T-SHEET PRINTS (Line) NA

SPECIAL REPORTS (Line)

Hi-Fix Calibration & Fathometer Velocity Correction Reports

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				3204
POSITIONS CHECKED		50		
POSITIONS REVISED		12	0	
DEPTH SOUNDINGS REVISED		187		
DEPTH SOUNDINGS ERRONEOUSLY SPACED				
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED				
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS				
JUNCTIONS		8		
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		20		
SPECIAL ADJUSTMENTS				
ALL OTHER WORK		286		
TOTALS		314		

PRE-VERIFICATION BY	BEGINNING DATE	ENDING DATE
VERIFICATION BY Evelyn J. Fields & Guy F. Trefethen	BEGINNING DATE 10-13-72	ENDING DATE 4-14-73
REVIEW BY	BEGINNING DATE	ENDING DATE

VERIFIER: Harry R. Smith

Norfolk, Va.
Nov. 3, 1971

VERIFICATION BRANCH
PLOTTER NOTE TO KERR EDP (AMC)

H#9137 (Mi 40-1-70)

Before plotting, the fathograms were check scanned by personnel of this Branch. Field scanning was very good and no changes are needed at this time

Hugh L. Proffitt
Chief, Verification Br., AMC

Verifier: Evelyn J. Fields

Norfolk, Va.
Oct. 31, 1972

VERIFICATION BRANCH
PLOTTER NOTE TO
EDP (AMC)

SURVEY H-9137 (Mi 40-1-70)

The Branch has completed the verification of the preliminary position overlay for this survey. We are returning the position printout with about 12 positional changes marked in blue pencil.

Red arcs from station FISH are incorrectly positioned on this preliminary overlay, but the ship positions were not affected as they were computed independently.

After the changes have been made to the incorrect positions, please furnish this Branch a sounding overlay.

Hugh L. Proffitt
Chief, Verification Br., AMC

Verifier:..E.J.Fields

March,13,1973
Norfolk,Va.

VERIFICATION NOTE TO EDP (AMC)
SURVEY H-9137 (MI-40-1-70) OPR 438

This branch has completed the verification of the sounding overlay for this survey.

We are returning the position and sounding printouts with all needed corrections marked in purple pencil.

There were only four (4) positional changes to be made and there are 187 sounding changes to be made.

The positions to be corrected are as follows:
103,2250,2251,and 2252.

The tide,velocity,and tc/ti correctors have been verified and are considered correct.

After the above changes have been made please furnish this branch with a smooth sheet.

Personnel of this branch have key-punched cards for the needed changes and accompany this note.

WLJ

Hugh L.Proffitt
Chief,Ver.Br. AMC

VERIFIER: Guy F. Trefethen Apr. 19, 1973

VERIFICATION NOTE TO EDP (AMC)
SURVEY H-9137 (MI 40-1-70), OPR-438

Verification has been completed on this survey and we are returning the preliminary printout with final corrections entered in colored pencil. Approximately 125 changes were made. These were keypunched and the cards are being sent with the printout.

Please enter these final corrections in the magnetic tape records for this survey and furnish a clean printout for submission with the dmooth sheet.

Hugh L. Proffitt
Chief, Ver. Br., AMC

VERIFICATION NOTE

H-9137 (MI 40-1-70)

GENERAL

This appears to be an excellent basic survey. The few minor problems experienced during verification are listed in the enclosed "Plotter" Notes".

Hugh L. Proffitt
Chief, Verification Br., AMC

Norfolk, Va.
April 24, 1973

ATLANTIC MARINE CENTER
APPROVAL SHEET
FOR
AUTOMATED SURVEY H-9137

A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position printout has/~~has not~~ been made. A new final sounding printout has/~~has not~~ been made.

Date: 4-24-73

Signed: Hugh L. Proffitt

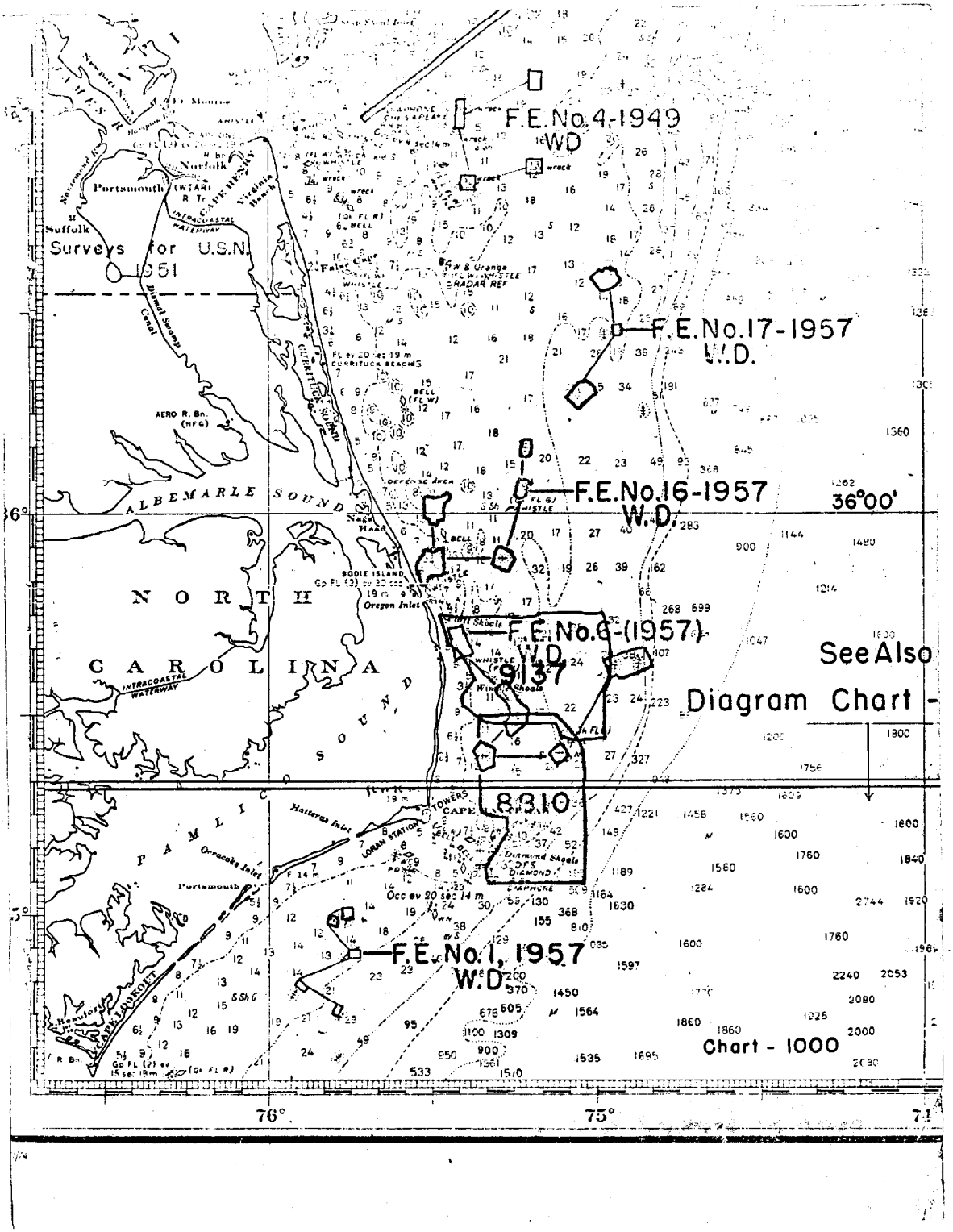
Title: Chief, Verification Branch

B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic and AMC Manuals. Exceptions are listed in the verifier's report.

Date: 4-24-73

Signed: Karl W. Kieninger, Jr.

Title: Chief, Processing Division


F.E.No.4-1949
W.D.
F.E.No.17-1957
W.D.
F.E.No.16-1957
W.D.
F.E.No.6-(1957)
W.D.
F.E.No.1, 1957
W.D.
Surveys for U.S.N.
1951
See Also
Diagram Chart -
8310
937
Chart - 1000
36°00'
NORTH
CAROLINA
ALBEMARLE SOUND
PAMLICO SOUND
Portsmouth
Norfolk
Suffolk
Oregon Inlet
Hatteras Inlet
Ocracoke Inlet
CAPE HATTERAS
CAPE LOOKOUT
76°
75°

(3-25-63) NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9137

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
1000	9-26-73	H. Ladden	~~Full~~ Part ~~Before~~ After Verification Review Inspection Signed Via (before)
			Drawing No. 50 Added two soundings and revised 20 fathom curve
1232	10/4/73	D. Harpine	~~Full~~ Part Before ~~After Verification~~ Review Inspection Signed Via
			Drawing No.
129-SC	10-23-73	H Larson	~~Full~~ Part Before ~~After Verification~~ Review Inspection Signed Via
			Drawing No. 7
1229	12/3/73	H Larson	~~Full~~ Part ~~Before~~ After Verification Review, Before Inspection Signed Via
			Drawing No. No critical corr
1109	12/14/73	B. Fernandez	~~Full~~ Part ~~Before~~ After Verification Review Inspection Signed Via (Before)
			Drawing No. No critical corr
12204	JO'C		
(1229)	9-24-80	D.C. Harpine	~~Full~~ Part ~~Before~~ After Verification Review Inspection Signed Via
			Drawing No. 41 Appd Critical Corrections
	JO'C		
11555	9-23-80	D.C. Harpine	~~Full~~ Part ~~Before~~ After Verification Review Inspection Signed Via
(1232)			Drawing No. 41 Appd Critical Corrections
	JO'C		
12200	9-24-80	D.C. Harpine	Full Part ~~Before~~ After Verification Review Inspection Signed Via
(1109)			Drawing No. 46 Appd Critical Corrections
	JO'C		
12205	9-24-80	JH	Full Part Before After Verification Review Inspection Signed Via
(129-SC "C")			Drawing No. 15C No Corr
			ADEQUATE
11520		Mary J. Green	~~Full Part~~ Before ~~After Verification~~ Review Inspection Signed Via
			Drawing No. 41 Adequately appd Hydro Chart 12200
11009	2-17-83	B. Fernandez	Requests Before Review, Inspection Signed Via
			~~Drawing No. 49 Adequately appd Hydro chart~~ 10
12205 B	2-20-90	E. SPENCER	CAT. #1 CONSIDER ADEQUATELY APPLIED - NO FURTHER CORR.

FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975. USCOMM-DC 8558-P83